

# Corticosteroid classes: A quick reference guide including patch test substances and cross-reactivity

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In the 2004 Burden of Skin Disease study conducted by the American Academy of Dermatology Association and the Society for Investigative Dermatology, approximately 90.6 million Americans were reported to be affected by psoriasis, atopic dermatitis, and allergic contact dermatitis.<sup>1</sup> Importantly, the leading therapeutic modality for these dermatitides is unquestionably topical corticosteroids. Although allergic contact dermatitis to topically applied corticosteroids was first reported in 1959, corticosteroid allergy has only been a widely recognized entity for the past 17 years.<sup>2</sup> In their patch test results for 2001 and 2002, the North American Contact Dermatitis Group reported a 3% incidence rate in positive reactions to tixocortol-21-pivalate (up from 2.7% the year before), a 1.1% incidence rate for budesonide, and a 0.5% incidence rate for hydrocortisone-17-butyrate.<sup>3</sup> In fact, this family of allergens has become so prevalent that the North American Contact Dermatitis Group added triamcinolone acetonide and clobetasol-17-propionate to the 2003 standard series.<sup>3</sup> With broad and vast utilization, it stands to reason that corticosteroids became recognized as the American Contact Dermatitis Society's 2005 allergen of the year.<sup>4</sup> The anti-inflammatory nature of corticosteroids makes the diagnosis of

allergy more difficult, but should be considered in patients suffering from intractable dermatitis.

This review card (Table I) was designed as a quick reference for practitioners that offers topical corticosteroid alternative classes, cross-reactions, and potency information on the common corticosteroids used in the treatment of atopic dermatitis, psoriasis, and allergic contact dermatitis.<sup>5-14</sup>

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**Table I.** Corticosteroid classes

Structural class	Class A: Hydrocortisone type	Class B: Triamcinolone acetonide type	Class C: Betamethasone type	Class D1: Betamethasone dipropionate type	Class D2: Methylprednisolone aceponate type
<b>Structure</b>	No substitutions in the D ring, except C21 short-chain esters	C16,17- <i>cis</i> -diol or -ketal	C16 methyl substitution	C16-methyl substitution C17/C21-long-chain ester	C16-No methyl substitution C16-No halogenation C17-long-chain ester C21-possible side chain
<b>Cross-reactions</b>	<b>Cross-reacts with D2</b>	<b>Budesonide specifically cross-reacts with D2</b>			<b>Cross-reacts with class A and budesonide</b>
<b>Patch test substance</b>	<b>Tixocortol-21-pivalate</b>	<b>Budesonide</b>		<b>Clobetasol-17-propionate</b>	<b>Hydrocortisone-17-butyrate</b>
<b>Class 1 Superpotent</b>		<b>Triamcinolone acetonide</b>		<b>Betamethasone dipropionate</b> (Diprolene 0.05% G, O, L) <b>Clobetasol propionate</b> (Clobex Cormax, Dermovate, Temovate C, O, G, S Olux foam 0.05%) <b>Diflorasone diacetate</b> (Psorcon 0.05% O) <b>Betamethasone dipropionate</b> (Diprosone, Maxivate 0.05% O Diprolene AF 0.05% C) <b>Betamethasone valerate</b> (Betnovate 0.1%) <b>Diflorasone diacetate</b> (Florone, Maxiflor 0.05%)	
<b>Class 2 Potent</b>		<b>Amcinonide</b> (Cyclocort 0.1% O, L, C)  <b>Budesonide</b> (Naricort 0.025% C) <b>Fluocinonide</b> (Lidex 0.05% C, O, G, S) <b>Halcinonide</b> (Halog 0.1% C, O, S)	<b>Desoximetasone</b> (Topi-cort 0.25% C, 0.05% G)		
<b>Class 3 Upper mid-strength</b>		<b>Amcinonide</b> (Cyclocort 0.1% L) <b>Fluocinonide</b> (Lidex 0.05%)  <b>Triamcinolone acetonide</b> (Aristocort Kenalog 0.1% C, O) <b>Triamcinolone diacetate</b> (Amcort, Aristocort 0.1% C, O)		<b>Betamethasone dipropionate</b> (Diprosone, Maxivate 0.05% C) <b>Betamethasone valerate</b> (Betatrex, Valisone 0.1%, O, Luxiq foam 0.12%) <b>Clobetasone butyrate</b> (Eumovate 0.05%)  <b>Diflorasone diacetate</b> (Florone, Maxiflor 0.05% C)  <b>Fluticasone propionate</b> (Cutivate 0.005% O)	

Table I. Cont'd

Structural class	Class A: Hydrocortisone type	Class B: Triamcinolone acetonide type	Class C: Betamethasone type	Class D1: Betamethasone dipropionate type	Class D2: Methylprednisolone aceponate type
Class 4 Mid-strength		<b>Amcinonide</b> (Cyclocort 0.1% C)	<b>Clocortolone pivalate</b> (Cloderm 0.1% C)	<b>Mometasone furoate</b> (Elocon 0.1% O)	<b>Hydrocortisone valerate</b> (Westcort 0.2% O)
		<b>Fluocinolone acetonide</b> (Derma-Smoother 0.01%, Synalar 0.025% O)	<b>Desoximetasone</b> (Topicort 0.05% emollient cream)	<b>Clobetasone butyrate</b> (Eumovate 0.05%)	
		<b>Halcinonide</b> (Halog 0.025%, C)		<b>Mometasone furoate</b> (Elocon 0.1% C, L)	
		<b>Triamcinolone acetonide</b> (Aristocort, Kenalog, Triacet 0.1%, O)			
		<b>Triamcinolone diacetate</b> (Amcort, Aristocort 0.1%, O)			
Class 5 Lower mid-strength		<b>Desonide</b> (DesOwen, Tridesilon 0.05% O)		<b>Betamethasone dipropionate</b> (Diprosone, Maxivate 0.05% L)	<b>Hydrocortisone buteprate</b> (Pandel 0.1% C, O, S)
		<b>Fluocinolone acetonide</b> (Derma-Smoother, Synalar 0.025% C)		<b>Betamethasone valerate</b> (Betatrex, Valisone C, L)	<b>Hydrocortisone butyrate</b> (Locoid 0.1% C, O, S)
		<b>Triamcinolone acetonide</b> (Aristocort, Kenalog 0.1% C, Kenalog 0.025% O, L)		<b>Fluticasone propionate</b> (Cutivate 0.05% C)	<b>Hydrocortisone valerate</b> (Westcort 0.2% C)
		<b>Triamcinolone diacetate</b> (Amcort, Aristocort 0.1% C)			<b>Prednicarbate</b> (Dermatop 0.1% C)
		<b>Desonide</b> (DesOwen, Tridesilon 0.05% C)		<b>Alclometasone dipropionate</b> (Aclovate 0.05% C, O)	
Class 6 Mild		<b>Fluocinolone acetonide</b> (Derma-Smoother, Synalar 0.01% C, Sol)		<b>Betamethasone valerate</b> (Valisone 0.1% C)	
		<b>Triamcinolone acetonide</b> (Aristocort, Kenalog 0.025% C)			

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Table I. Cont'd

Structural class	Class A: Hydrocortisone type	Class B: Triamcinolone acetonide type	Class C: Betamethasone type	Class D1: Betamethasone dipropionate type	Class D2: Methylprednisolone aceponate type
		<b>Triamcinolone diacetate</b> (Amcort, Aristocort 0.025% C)			
<b>Class 7 Least potent</b>	<b>Hydrocortisone</b> ( <i>Bactine, Caldecort, Corticaïne, Delacort, Dermolate, Hytone, Prepcort, Resicort</i> ) <b>Hydrocortisone acetate</b> ( <i>Cortaid, Cortef Femi nine or Rectal Itch Cream, Gynecort, Lanacort, Wellcortin</i> ) <b>Methylprednisolone, prednisolone</b> <b>Tixocortol pivalate</b> ( <i>Pivalone</i> )				
<b>Additional Information</b>	<b>Oral:</b> <b>Cloprednol, fludrocortisone acetate</b> ( <i>Florinef</i> ), <b>methylpredniso- lone</b> ( <i>Medrol</i> ), <b>prednisone</b> ( <i>Cortan, Deltasone, Meticorten, Orasone, Panasol-S</i> ), <b>prednisolone</b> ( <i>Pediapred, Prelone Syrup</i> ) <b>Drops(Optic/Otic):</b> <b>Fluorometholone, medrysone, prednisolone</b> ( <i>AK-Pred, Blephamide, Blephamide Liquifilm, Econopred Plus, Inflamase, Poly-Pred</i> )	<b>Oral:</b> <b>Budesonide</b> ( <i>Entocort</i> ), <b>triamcinolone</b>  <b>Inhaler/nasal spray:</b> <b>Budesonide</b> ( <i>Pulmicort, Rhinocort</i> ), <b>flunisolide</b> ( <i>Aerobid</i> ), <b>triamcino- lone</b> ( <i>Azmacort</i> )	<b>Oral:</b> <b>Betamethasone</b> ( <i>Celestone</i> ), <b>dexamethasone</b> ( <i>Decadron, DexPak</i> )  <b>Optic drops:</b> <b>Dexamethasone</b> ( <i>Maxidex</i> ), <b>rimexolone</b> ( <i>Vexol</i> )  <b>Topical sprays:</b> <b>Dexamethasone</b> ( <i>Aeroseb-Dex, Decaspray</i> )	<b>Oral/IM:</b> <b>Betamethasone</b>  <b>Inhaler/nasal spray:</b> Beclome- thasone dipropionate ( <i>Beclovent, Beconase, Qvar</i> ), <b>fluticasone propionate</b> ( <i>Flonase, Flovent</i> ), <b>mome- tasone furoate</b> ( <i>Nasonex</i> )	<b>Oral/IV:</b> <b>Hydrocortisone</b>

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Structural class	Class A: Hydrocortisone type	Class B: Triamcinolone acetonide type	Class C: Betamethasone type	Class D1: Betamethasone dipropionate type	Class D2: Methylprednisolone aceponate type
	<i>Liquifilm, Pred Forte</i> ), <b>prednisolone acetate</b> ( <i>Belphamide</i> , <i>Econopred</i> )				
	<b>Worldwide/research:</b> <b>Dichlorisone acetate</b> , <b>isofluprednone acetate</b> , <b>fluprednisolone acetate</b> , <b>mazipredonum</b> , <b>prednisolone caproate</b> ( <i>Scheriproct O</i> , Supp)	<b>Worldwide/research:</b> <b>Flucloronide procinonide</b> ( <i>Trisyn</i> : fluocinonide procinonide ciprocinonide), <b>flucloronide</b> ( <i>Fluclorolone acetonide</i> , <i>Topilar</i> ), <b>flunisolide</b> ( <i>Nasalide</i> ), <b>triamcinolone</b> ( <i>Atolone</i> )	<b>Worldwide/research:</b> <b>Diflucortolone valerate</b> ( <i>Nerisona</i> ), <b>fluocortin butyl</b> , <b>halometasone fluprednidene acetate</b> ( <i>Decoderm</i> ), <b>fluocortolone</b> ( <i>Ultralan</i> ), <b>meprednisone</b>	<b>Worldwide research:</b> <b>Clobetasone propionate</b>	<b>Worldwide/research:</b> <b>Hydrocortisone aceponate</b> ( <i>Efficort</i> , <i>Retef</i> ), <b>methylprednisolone aceponate</b> ( <i>Advantan</i> )

C, Cream; G, gel; IM, intramuscular; IV, intravenous; L, lotion; O, ointment; S, solution; Supp, suppository.